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Temperature, &c., of the North Atlantic Ocean, for the month of January, during the years 1849-52. By N. Whitley, Esq.

The following Papers were read :—

1. *Recent Explorations in the Peninsula of Sinai.*

By the Rev. F. W. HOLLAND.

THE project of a systematic survey of the Peninsula of Sinai owes its origin to the Rev. Mr. Pierce Butler, late Rector of Ulcombe, Kent; and although he himself was not spared to aid in carrying out that project, to which he had devoted so much energy and thought, to him we are mainly indebted that a well organised expedition, under the superintendence of the Director-General of the Ordnance Survey, is now engaged in making explorations in that most interesting country.

I much regret that the present session of the Royal Geographical Society will have come nearly to an end before the return of the officers in command of that expedition, and that they themselves will therefore not have an opportunity of laying before you the result of their work.

But such being the case, having had the advantage of working with them during the first three months that they spent in the Peninsula, and having had access to their reports and letters home since that time, I have ventured to record in the following Paper the progress that has been made.

There are many people, I believe, who have concluded that the Peninsula of Sinai must *already* have been a well explored country, since so many travellers have visited it, and so many books have been written about it; but, owing to various local causes, there is probably no other country in which travellers have been led to carry out more fully their ovine propensity to follow exactly in each other's steps; and, consequently, it is only the *main* wadys, or valleys, which form the high-roads, and one or two of the principal mountains, that have been explored, and even those very hastily and incompletely. There can be no doubt, too, that the religious enthusiasm which has led many travellers to the country, however much it may claim our sympathy, has nevertheless tended in a very great degree to lower the value of the information obtained. A man who goes out with foregone conclusions as to what the country *ought* to be, and where the Children of Israel *ought* to have marched, is almost sure to favour his own prejudices to the exclusion of truth.

Thus it happens that although the *coast line* of the Peninsula of

Sinai has for many years been well laid down by a nautical survey, the *interior* has remained, with the exception of a few parts, but little known to us; and we have had as yet no sufficiently accurate data for instituting a just comparison between its *present* and its *past* condition, or asserting how far it illustrates the truth of that history, which alone renders it a land of such intense interest to us. Hence the importance of a *careful* and *systematic* survey of the country, conducted by professional men, free from all bias, and of whose accuracy there cannot be any suspicion.

The organisation of the expedition is all that could be wished. It is under the command of Captains Wilson and Palmer, of the Royal Engineers, the former of whom is well known for his admirable survey of Jerusalem. The other members of the expedition are Mr. Palmer, Fellow of St. John's College, Cambridge, a very able Oriental scholar, and quite worthy of the name of "Pundit," which he soon received to distinguish him from Captain Palmer; Mr. Wyatt, who volunteered to go out entirely at his own expense, to study the natural history of the country and collect specimens; Sergeant MacDonald, who is an experienced photographer, and three other non-commissioned officers of the Royal Engineers, all of whom have been specially selected for the work from the staff of the Ordnance Survey.

My own previous knowledge of the country and Arabs, gained chiefly during four months' solitary wandering amongst them in the preceding year, led to my being requested to accompany the expedition in the capacity of guide, a request to which I readily acceded, and I remained with them up to the beginning of February (when I was obliged to return home), rendering such assistance as I could.

We sailed from Southampton on the 24th of October last, and landed at Alexandria on the 7th of November. The Viceroy, at the request of Colonel Stanton, had given orders that our baggage should be passed through the custom-house unopened, and that every assistance should be given us by the officials; and thus we were enabled to proceed that same evening to Suez, where we arrived early on the following morning.

I had sent a message several weeks before to some of the Arab sheikhs of Sinai to tell them that we were coming out; and on alighting from the train I was welcomed by several of my old acquaintances, who for many days had haunted the platform in expectation of our arrival.

The Peninsular and Oriental Company kindly gave us permission to draw provisions from their stores; and three days were busily

spent at Suez in selecting and packing the things we required, buying water-skins, barrels, and the numerous requisites for a desert life, and drawing up a contract with the Arab sheikhs for camels, which is always a somewhat lengthy process.

Mr. Palmer, who had arrived in Egypt a few weeks before us, now joined us. He had meanwhile been profitably engaged in Cairo, in examining the colleges and libraries attached to some of the principal mosques.

On Wednesday, November 11th, we sent on our camels round the head of the Gulf of Suez, to await our arrival on the opposite shore, and in the afternoon conveyed our baggage across by boat, and pitched our tents for the first night in the desert. Our caravan consisted of 32 camels laden with our baggage and stores, and 12 dromedaries for riding, including those of our two sheikhs.

The Arabs in the southern portion of the Peninsula of Sinai are so poor, that no single sheikh was able to provide so large a number of camels as we required, and we therefore found ourselves compelled to engage two sheikhs, an arrangement which was a continual source of contention as long as they were with us, since there was a daily fight for the lightest loads, and much jealousy between the two parties, neither of whom paid very much deference to their respective sheikhs. The management of the Arabs, therefore, and superintendence of the daily loading of the camels, which fell to my charge, was at this time no sinecure.

Three days' journey brought us to Wady Ghurundel, where we halted for Sunday. We took the upper road after passing "the wells of Moses," and the barren plain along which our course lay offered few points of interest. Mr. Palmer found, however, that several of the names which have been given to different wadys in this portion of the desert are wrong, and none of them appeared to have any reference to the passage of the Israelites, as some authors have supposed. We saw abundant evidences, as we proceeded, of different sea-levels of former times, and many of the stones are curiously furrowed and wrinkled by the action of the drifting sand. I remarked that some of these stones presented the exact appearance of miniature sand-drifts.

We stopped on our way to examine the spring of "Ain Howara," which many have sought to identify with *Marah*, on account of the bitterness of its water. The water was slightly brackish and dirty, but it was cool and drinkable, and better, I thought, than the water that we had with us. I cannot satisfactorily explain the extreme bitterness of this water at one time and its comparative sweetness at another. A few miles south of this point a natural basin is found,

into which the water drains from the surrounding desert, and its fertility proves how productive the desert is wherever water can be obtained.

While encamped in Wady Ghurundel we enjoyed the luxury of a bathe in the clear running stream, which bursts forth a few miles from its mouth but again disappears in the sand before it reaches the sea; not, however, before it has given birth to a considerable amount of vegetation, and formed extensive marshes, which are the favourite resort of wild ducks and other birds.

We also examined the country between Ain Howara and the sea, near the mouth of Wady Ghurundel, and found it to consist of broken ground with deep intersecting wadys and ridges, which must always have rendered it utterly unsuitable for a camping-ground.

From Wady Ghurundel we made our way across the plain, at the heads of Wadys Useit and Eth Thal, and up Wady Humr, to Jebel Sarbût el Gemal. Shortly after leaving Wady Ghurundel we passed the well-known heap of stones called Abu Zenneh. The Arabs, in passing, always curse the spot, shoot off their guns at it, and throw stones upon the heap, saying, "Eat, eat, horse of Abu Zenneh." The reason of their doing so has never yet been explained, but Mr. Palmer obtained from our Arabs the following interesting legend concerning it:—"An Arab named Zenneh, who possessed a beautiful mare, as he rode by this spot one day, touched it with his spur, and it took an enormous leap, the length of which so astonished him that he marked it with two stones, and pointed it out to his friends, who never afterwards passed this spot without celebrating the praises of the mare. After a time the Arabs began to worship her, and brought offerings of corn, which they threw down, saying, 'Eat, eat, horse of Abu Zenneh.' But at length a prophet came who taught them to worship the true God, and to give up the worship of all other things; and that which they had before worshipped now became an abomination to them; so that they no longer brought offerings of corn, but threw dust and stones upon the heap, saying, 'Eat this, horse of Abu Zenneh.'"

This legend seems to bear some marks of truth, and I would remark, in passing, that the mention of a horse is interesting, as a slight additional evidence of a change having taken place in the country, since horses are now unknown there, and could not exist in so barren a desert as it is at the present time.

In Wady Humr we saw the first Sinaitic inscriptions. From this point they occur frequently along the different wadys which form the roads to Jebel Serbal, Jebel Mûsa, and the south.

From Jebel Sarbût el Gemal we struck southwards, across the

sandy slopes of Debbet-en-Nusb, to Wady Nusb, well known for its excellent wells of water, which caused it to be formerly the centre of the mining operations in that district, as is shown by the large heaps of slag which are found at the mouth of the valley, and more especially in the immediate neighbourhood of the wells. We did not, however, then stop to examine the mines, but pushed on as quickly as possible towards Jebel Mûsa. We paid a hasty visit to the ruins of Serâbit-el-Khadim in passing, and I was able to point out to Captain Wilson the position of the turquoise mines, Egyptian tablets, and other ruins, which have since been revisited and more fully explored.

We followed the northern route to Jebel Mûsa by Wadys Kamyle, Burku, and Berâh, because it afforded the shortest road, and the most favourable, for a line of observations between Suez and Jebel Mûsa. Materials for a route-sketch of our journey were collected as we proceeded, observations for latitude were taken at every camp, and aneroids read at all watersheds and watercourses.

At the head of Wady Berâh we ascended a remarkable conical hill, called Zibb-el-Bahayr, from which a magnificent view is obtained of the whole surrounding country. The uniform height of many of the granitic mountains is a striking feature, and suggests the idea of there having originally been a vast plateau of granite, on which the sandstone was deposited; the wadys, which now intersect it in every direction, having been subsequently formed by the action of water. Lower down, in Wady Berâh, we passed a large detached rock, covered with Sinaitic inscriptions, which was said by the Arabs to have been cleft by Moses with his sword, to enable the Israelites to pass it. At the foot, at that wady, we crossed over by Wady el Akhdar (the Green Valley) and Wady el Ush (the Valley of the Nest) to Wady es Sheikh, which we followed up till it brought us, on Nov. 21st (just ten days from the time of our leaving Suez), to Jebel Mûsa. Wady el Akhdar is the name of the wady to which in my former paper I gave the name of Wady el Huther. I was wrong, therefore, in supposing that I might have found here traces of the name Hazeroth.

After selecting a spot for our camp at the foot of the so-called Aaron's Hill, near the mouth of Wady ed Deir, we paid a visit to the convent, where we were most hospitably received by the monks, and they very kindly placed a room at our disposal as a store-room. They pressed us to take up our quarters in the convent, but we preferred the independence of a tent life.

Having dismissed all our Arabs, and unpacked our stores, we set to work at once upon the special survey of Jebel Mûsa, which was

to be made on the scale of six inches to a mile. A base was selected on the plain of er Rahah, and the limits of the survey having been settled, viz., the watershed of the plain of er Rahah on the north, Jebel Abu Aldi on the south, Wady Sebaiyeh on the east, and Wady Leja on the west, we all set to work to get the poling done, while the men were engaged in measuring the base and lower ground. The base was 69 chains 34 links in length, and the dimensions of the survey 4 miles by $4\frac{1}{2}$. The poling was a work of great labour. The monks supplied us with some good poles for the ends of the base, but at all other stations we had to build cairns of stone, and whitewash them.

There were twenty-nine stations, and, with the exception of four, their heights above our camp ranged from 800 feet, the lowest, to 2500 feet, the highest. But the height in feet does not give any idea of the difficulty of the climbing which had to be done. The necessity of carrying a pot of whitewash in one's hand, the upsetting of which would often have lost one a whole day's work, added much to the difficulty; and it had sometimes to be carried in the mouth as we crawled along narrow ledges overhanging precipices many hundred feet in height, or used each other by turns as ladders. Once Captain Palmer and I found ourselves on a ledge of rock on Jebel Mûsa from which it was impossible to proceed either up or down, but fortunately I had taken the precaution that day of taking with me a rope, and with it I lowered down Captain Palmer, and then, lying on my back, slid down as gently as I could, and he succeeded in breaking my fall at the bottom.

When the poling was completed we had again to visit most of the stations to take observations from them—a work which we could hardly have accomplished without the aid of some Arab ibex-hunters, whose bare feet, and experience in mountain work, enabled them to carry up the instruments without injury—and the calculation of the observations gave most satisfactory results. In the lower ground there were $31\frac{1}{2}$ miles of traverse, not including offsets. The leveling, which amounted to $19\frac{1}{2}$ miles, was also a work of great difficulty, on account of the roughness of the watercourses and the great rises and falls crossing the watersheds.

I regret that I am unable to give accurate measurements with regard to the details of this survey, but a brief account of its main features may prove of interest. The peaks of Ras Sufsafeh, which form the northern portion of Jebel Mûsa, mark pretty nearly its central point. These rise up precipitously (about 2000 feet high) from the base of the plain of er Rahah, which is about two miles long and half a mile broad.

The plain of er Rahah is bounded on the west by a low ridge of mountains, which separates it from Wady Ilah and Jebel Tinia, and on the east by the block of mountains generally known as Jebel Fureya, but that name is properly applied only to the fertile basin which occupies the northern portion of the summit of that block. There appears to be no single name for the whole block, but the peaks which enclose it all have their individual names, such as Ajeraméa, Allojah, Soná, &c.

The southern peak of Jebel Mûsa is its highest point, and to this the name of Jebel Mûsa is especially applied. A central elevated basin, encircled by a ring of higher peaks, is a common feature in the mountains throughout the granitic district, and such is the character of the block of Jebel Mûsa, which is about 2 miles long and 1 mile broad. On the east of it runs Wady Ed Deir, so called from the convent which is situated here, and west of it runs Wady Shuraich, which again is separated from Wady Leja (a valley lying farther westwards) by the narrow ridge of Jebel Fara. Thus on the north, east, and west, Jebel Mûsa is separated from the surrounding mountains; on the south two wadys—one flowing eastwards into Wady Sebaiyeh, and the other westwards into Wady Leja—separate it from Jebel Abu Aldi, and the high range of mountains which bounds Wady Sebaiyeh on the west.

At the head of the convent valley stands a low rounded mountain, called Jebel Munedjah, and on the east of it the fine block of Jebel Ed Deir, which is divided by two ravines running north and south into three parts, the central and highest one of which is called Jebel Oribah. An extensive recess, about $1\frac{1}{2}$ mile long by $\frac{3}{4}$ broad, near the mouth of Wady Leja, adds largely to the available camping-ground before the Ras Sufsafah, which is generally supposed to have been the point from which the Law was given. There are five paths to the top of Jebel Mûsa.

(1.) A carriage-road made by Abbas Pasha from the head of the convent valley.

(2.) The well-known path leading up from the convent.

(3.) Another path up a ravine at the north-east corner of the mountain, by which we generally ascended it from our camp.

(4.) A fourth, leading up from the head of Wady Shuraich.

(5.) And the fifth from the ruined monastery of "El Erbain," at the head of Wady Leja.

The four last all appear to show traces of rude steps, which probably date from the earlier monastic times. The number of ruins of hermits' cells, which are found scattered over the surrounding mountains, is perfectly extraordinary; and the frequent occurrence

of walls, reservoirs, and traces of terraces for gardens, proves that almost every available spot was at one time under cultivation. There is no doubt that corn was grown in many spots; and when all the valleys and mountain-basins around Jebel Mûsa were more or less a succession of gardens, containing vines, palm, apricot, apple, pear, orange, pomegranate, walnut, mulberry, and carrûb trees,—when the supply of water from every spring was carefully husbanded in reservoirs, and skilfully conveyed from garden to garden,—it must have presented to the eye a perfect paradise.

While encamped at Jebel Mûsa we made an excursion to Jebel Abu Mas'ûd, in order to take bearings from the summit of that mountain, which was to form the south-east limit of the reconnoissance survey, and also to examine a remarkable group of ruins called by the Arabs "*namûs*," or in the plural "*nuâmis*," mosquitoes, which I described in a former paper.

"These buildings," writes Captain Wilson, "are almost circular, with a domed roof rising immediately from the lintel of a door about 21 inches high; the dome is formed by stones overhanging each other, the top being closed by a large slab of stone, and the haunches weighted to prevent their springing out. I cannot describe them better than by saying that they are identical in construction with the chambers in the large cairns at Clava, near Inverness, one of the oldest known forms of habitation. Several of the '*nuâmis*' have been used as burial-places by a people probably of a later date than the builders of the houses, but still at a very remote period. Three of these were opened, but no opinion could be formed on the mode of burial. The bones were found mixed with earth and a little charcoal, but crumbled to pieces directly they were touched: a shell bracelet, broken and mended again, and a shell bead, were the only articles found. On our return to Jebel Mûsa we found a group of five stone circles, with small cairns in the centre exactly similar to what are called Druids' circles in Scotland, the stones being set on end and touching each other."

I may add that the "*nuâmis*" and stone circles are found in great numbers throughout the whole of the south of the Peninsula; the largest groups that I have found being situated in a small wady between the head of Wady Hibran and Wady Solaf, in the neighbourhood of Dahab, and on the plateau of Zeranik.

Towards the end of December it grew so cold that hill-sketching was impossible on the higher mountains, and occasional snow-storms interfered much with the progress of the survey. Most of the highest peaks in the neighbourhood of Jebel Mûsa were, however, ascended, and true bearings were taken from Jebels Katharine, Ed Deir, Tinia

(on the summit of which stands Abbas Pasha's half-built palace), and several other well-known mountains; and thus the position of most of the prominent peaks in this part of the Peninsula was fixed, and their altitudes determined by angles of elevation and depression. The altitudes of all peaks ascended were also determined by boiling-point thermometers and aneroid barometers; but the latter we found could not be depended upon to 300 or 400 feet, at so great an altitude above the sea (5000 feet).

I should mention that the latitude of our camp was obtained by the mean of twenty-two observations, and from this the latitudes of Jebels Mûsa and Katharine were computed. Observations for longitude and variation were also taken.

On the 1st of January we started for Jebel Serbal, connecting it on our way with Jebel Mûsa by a traverse survey, which was carried "through the pass" of Nukb Hawa, at the head of the plain of er Rahah, and down Wadys Solaf and Feiran.

The special survey of Jebel Serbal (also on the scale of 6 inches to the mile) presented difficulties almost as great as that of Jebel Mûsa.

A base was selected in Wady Feiran, between el Hessue and Wady Ajeleh. The same process of cairning had to be gone through, and each morning, for upwards of a week, we started off, with our pots of whitewash in our hands, to climb peaks, the ascent of two or three of which, notwithstanding their close proximity, often proved a hard day's work, so deeply were they cut by intersecting ravines.

Our camp was pleasantly situated at the junction of Wadys Aleyat and Feiran, close to the oasis of Feiran, which terminates just at this point.

The following description of the mountain is taken from a letter written by Captain Palmer, after nearly a month's stay there:—

"Jebel Serbal is about 4 miles from the camp. In massive ruggedness, and in boldness of feature and outline, this mountain unquestionably presents an aspect unequalled by any other in the Peninsula, and, though not absolutely the highest, it has a greater command over the surrounding country than any we have yet seen. Unfortunately there is not a single point in the valleys near its base, which affords a comprehensive view of the mountain. It is only by ascending some of the neighbouring hills that the whole range of its magnificent peaks can be seen at once, and there is no plain anywhere in the vicinity suitable to the assembling of a large concourse of people in the sight of any one portion. Two valleys, Wadys Aleyat and Ajelah, each from 3 to 4 miles in length, rise from Wady Feiran to the actual base of Serbal, and furnish the

roughest examples we have yet experienced of the very rough walking in the Peninsula.

"Each (and especially Wady Ajelah, the western and narrower valley) is a wilderness of boulders, and torrent beds, and high banks of alluvial deposit, bearing the marks of many a flood. From points in these two valleys, and from a few spots also in Wady Feiran, imperfect views of Serbal are to be had; but from Wady Ajelah the highest peak is never seen. The space between the two, which, I think, has been described as a *plain*, is a chaos of rugged mountains, rising to as many as 2500 feet above Feiran, and concerning which our boots and knees could tell a very different tale."

The special survey comprised these two valleys and a portion of Wady Feiran, rather more than 2 miles in length.

While encamped in Wady Feiran we made many excursions to the surrounding mountains, and, amongst others, made the ascent of Jebel Benât, which, I believe, had never before been attempted.

During our whole stay in the Peninsula, Mr. Palmer and I had been constantly employed in examining and copying the Sinaitic inscriptions; and we had already collected upwards of 1800 from the granitic districts, when, on the 26th of January, we left the rest of our party for Wady Mokatteb, to work at the inscriptions there in their head-quarters.

We first copied every legible inscription in Wadys Mokatteb and Sidri, and then took impressions in paper and photographs of some of the most important ones.

We discovered altogether no less than twelve inscriptions in which the Greek and Sinaitic occur together, undoubtedly by the same hand, and by their means Mr. Palmer has been enabled to demonstrate the value of every letter of the Sinaitic alphabet.

Mr. Palmer has very rightly determined not to publish the full results of his study of the inscriptions until he shall have been able to consult the works that have already been written on the subject, and to devote more time and care to the examination of the copies which we have obtained than he is able to do in the intervals of his present work. But a letter from him, which was published in the 'Athenæum' of the 10th of April, states some of the conclusions at which he has arrived. He describes the inscriptions as consisting of detached sentences, for the most part proper names, with such introductory formulæ as Oriental peoples have been from time immemorial accustomed to prefix to their compositions (*e. g.* "Peace be to him," or "May he be remembered").

He speaks of the alphabet as agreeing in part with that constructed by the late Professor Beer, which is only partially correct,

since the copies of inscriptions with which he was furnished were not accurately made. With regard to the authorship, there can be no doubt that they are the work, not of pilgrims, but of a commercial community who inhabited, or at least colonised, the Peninsula for the first few centuries of the Christian era. That many of the writers were Christians is proved by the numerous Christian signs they used; but it is equally clear from internal evidence that a large portion of them were Pagans.

The numbers of the inscriptions have been much exaggerated. They were executed, no doubt, almost entirely with pointed stones, and the presence of water seems to have acted more than anything else in determining their position. It is not true that they occur at extraordinary heights from the ground, nor that they were confined to the road or roads to Serbal. I discovered them last year in wadys both east and south of Jebel Mûsa; and I believe that Captain Palmer has now also found them as far west as Jebel Taset-el-Sadur. They are by no means confined to the main roads, or valleys, but are to be found in all sorts of out-of-the-way places, along mountain footpaths, and on the tops of prominent peaks. They do not appear to be connected with mines, and there is evidently no connection between the Sinaitic and two hieroglyphic inscriptions at Wady Mughârah, the close proximity of which has led them to be described as a triple inscription. Lastly, they do undoubtedly occur *painted in whitewash* under an overhanging rock at the summit of Jebel Serbal; and the ruins of a building close by, in which similar whitewash occurs, seems to point to the fact that the inscriptions and the building were made by the same hands. Mr. Palmer speaks with confidence of his being able to bring as great a weight of testimony to bear on the authorship of the inscriptions as he has already collected in support of their interpretation. Few men are so well read in Arab literature, and I sincerely hope that his confidence will not prove to be misplaced.

It was with great regret that I turned my steps homewards from Wady Mokatteb just at the time when the special survey of Serbal had been so far completed as to set Captains Wilson and Palmer free to commence the general survey of the country. The limits of this general survey, on the scale of 2 inches to the mile, were to comprise the country between Suez, the ranges of Jebels er Rahar and Tih, the plain of Senned, Jebel Abu Mas'ûd, Jebel Umm Shaumer, Tor, and the Red Sea, *i.e.* the district through which the children of Israel must have marched, if either Jebels Serbal, or Mûsa, or any mountain south of the Tih range, be the real Mount Sinai. The special surveys have taken up so much time, that it has been found

impossible to survey the whole of this district, but all the principal valleys which alone could form the roads have been traversed. On leaving Serbal, Captains Wilson and Palmer followed down Wady Feiran, and joined "the Pundit" at W. Mokatteb. A few days were spent here in examining the mines, and then they continued their course down Wady Sidri, which has never before been traced, to the mouth of Wady Feiran, and so on to the plain of El Káa, and to Wadys Thugadeh and Sigillyeh, at the western base of Jebel Serbal.

In Wady Thugadeh they found a small stream and a good-sized palm-grove, but nothing more of interest. A day was devoted to the ascent of Wady Sigillyeh. At its mouth giant cliffs frown down upon a narrow chasm, in many places scarcely 20 feet in width, through which the drainage of nearly the whole southern slope of Jebels Serbal and Sigillyeh breaks by a succession of leaps into the plain below. Higher up, the valley expands into a wild and romantic mountain glen, through which flows a perennial stream. At the head of the valley stand the ruins of two monasteries, which were afterwards visited from the other side of Serbal.

From Wady Sigillyeh, a dreary walk of 20 miles over the burning waste of El Káa brought them to a spot called Abu Suweirah, on the shore of the Red Sea, not far from the celebrated Bell Mountain, Jebel Nakús. I have myself twice visited this mountain, but I prefer to describe it in Captain Palmer's own words:—"At a point about three-quarters of a mile, in a direct line from the sea, a slope of drift-sand 400 feet in height, and facing about w.s.w., fills a wide gully in the range of sandstone hills which flanks the mouth of Wady Arabeh on its southern side. This sand is so extremely fine and dry, and lies at so high an angle (about 30°) to the horizon as to be easily set in motion from any point in the slope, or even by scraping away a portion of the sand at its base. When any considerable quantity is thus set in movement, rolling gradually down the slope like some viscous fluid, then the sound begins—at first a deep, swelling, vibratory moan, gradually rising to a dull roar, loud enough at its height to be almost startling, and then gradually dying away till the sand ceases to roll. It is difficult to describe the sound. Perhaps the very hoarsest note of an Æolian harp is the best comparison I can draw, or even the sound produced by drawing the finger round the wet rim of a deep-toned finger-glass, save that there is far less music in the note produced by this rolling sand. Hot surface sand always appears to be more sonorous than the cooler layers underneath. The loudest result was obtained in the full heat of the afternoon sun, when the surface sand had a temperature of 103° Fahr.

"Sand which had long lain undisturbed seemed more sensitive than that which had been recently in motion. Thus the first trial on any one part of the slope was always more satisfactory than subsequent ones, and the experiments of the first day were better than those of the second. That this sound is purely local and superficial, and due in the first place to friction, there is, I think, no doubt whatever. I could even produce the sound in a faint degree by moving portions of the sand rapidly forward with a sweep of my arm.

"The Arabs state that the sounds can only be heard on Fridays and Sundays, and that they arise from the ringing of the Nakûs (a wooden board used in place of a bell) of a monastery that was mysteriously engulfed to save the monks from the treachery of an Arab guest."

From Jebel Nakûs the exploring party travelled by Tor and Wady Hebrân to their old camp in Wady Feiran.

On the 3rd of March they started on another expedition to Wady Ghurundel, following apparently the coast-road by the Nukb Badera, the Plain of Morkha, and Wady Taiyibeh.

From Wady Ghurundel Captain Palmer pushed on northwards to Jebel Bishâr, marked on the Admiralty Charts as Barn Hill, and generally miscalled Taset es Sadur, by the Tôwarah Arabs, who mistake it for another mountain far away in the Tih. The main object of his visit to this mountain was to take observations from its summit, so as to connect by latitudes and true bearing Suez and Jebel Mûsa.

Jebel Bishar is plainly seen from the roof of the Peninsular and Oriental Hotel at Suez, and the mountains of Sarbut el Gemal and Benât being easily seen from a great distance form a natural chain of connecting links.

I have obtained no detailed account of subsequent explorations, but in a report which I received from Sir Henry James this morning, and which was despatched from Jebel Mûsa on the 31st of March, Captain Wilson writes:—"The triangulation has been extended, and about 350 miles of route-survey made, including the roads to the interior by Wadys Sidri and Baba, the coast-road from Mokatteb to Ghurundel, portions of Wadys Eth Thal, Useit, Ghurundel, Es Sheikh, and El Akhdar; two roads from Wady Ghurundel, which enter the Jebel Mûsa district from the north; and the route from Ghurundel to Jebel Bishar. Detailed descriptions of the several valleys (he adds) will be given hereafter, but at present it may be mentioned that all practicable routes from Suez to the interior of the peninsula have been visited and surveyed with the exception of one south of Umm

Shaumer, which will be sketched next month. Notes have also been made on the water supply and vegetation in the districts examined. Altitudes have been determined by angles of elevation and depression, aneroid barometers and boiling-point thermometers.

"The hill-sketching of the survey of Jebel Serbal has been finished, and a model made by Corporal Goodwin of its most important features."

The hill-sketching of Jebel Mûsa is now in progress, and about three-eighths of it has been completed; a model of this district has also been commenced.

A large number of photographs and sketches have been taken, including views from the summits of Jebels Mûsa and Serbal. All the Egyptian tablets at Wady Mugharah, and most of those at Serâbit el Khadim, have been copied, and paper impressions taken of the most important ones. Several of the tablets are believed not to have been copied before, and one at Wady Mugharah appears to throw some light upon the character and nationality of the miners employed there.

A few excavations have been made at Serâbit el Khadim, principally with the object of uncovering fallen slabs. A few old tombs have also been opened, and drawings made, to show their construction.

A large collection of geological specimens has been made; and meteorological observations have been made at the camps in Wadys Feiran and ed Deir, and also at Suez, with instruments left there under the charge of Mr. Andrews, who kindly offered his assistance for this work.

A collection of birds has been made by Mr. Wyatt, and also a small collection of insects and plants by Mr. Palmer, but he has had little time to devote to such objects.

Mr. Palmer's special work has been the copying of the inscriptions, the collection of Arab tradition and stories, the ascertaining of the correct names of places, and, lastly, an examination of the manuscripts in the library at the convent.

In each department he has done good service. Night after night he has sat round the Arabs' camp-fires writing down their stories in Arabic; and, as he has travelled along, he has lost no opportunity of discovering local traditions. They are too wild to be of much value as records, but, being all written down in Arabic exactly as related to him, they will prove an exceedingly interesting collection to the Arabic scholar, since the Arabs of the desert speak the purest Arabic. The correct nomenclature of the country is also a most important point. I doubt if much has been found to throw

light upon the route of the Israelites, but a great deal of no less useful work has certainly been done by the upsetting of many impossible theories based on errors in names. I can speak from experience of Mr. Palmer's power of distinguishing the niceties of Bedawi pronunciation.

By this time the work of the expedition has been brought to a close, and the exploring party is on its way home. They intended to break up their camp at Jebel Mûsa on the 20th of this month. They will arrive, therefore, at Suez, about the end of the month; but, as they are going to stop in Egypt to take some measurements of the Pyramids, and intend afterwards to pay a visit to Jerusalem, we must not expect them home much before the end of May.

This hasty and imperfect sketch of their work will prove at least that it has been conducted with all the energy and skill which ought to render it successful; and I am glad to be able to add, that, with the exception of the first journey from Suez to Jebel Mûsa, the exploring party have travelled entirely on foot—the only way, I believe, of satisfactorily examining such a country.

Whatever may be the results of this expedition, it will, I believe, be so far exhaustive, as regards the portion of the peninsula surveyed, that we shall feel that we know all that can be known about it; and even if we fail to lay down any one route as that taken by the Children of Israel to Mount Sinai, we shall at all events receive undeniable evidence that the character of the country does answer in a remarkable degree to what we should expect to find from the accounts given of it in Holy Scripture.

The PRESIDENT, in returning thanks to Mr. Holland for his paper, said that the subject had been put before the meeting with great ability, clearness, and modesty. The journey which it described was the fourth which Mr. Holland had undertaken to Sinai. It would appear, from what he had said, that he was merely the narrator of what other people had done; whereas, before the topographical survey by these able Ordnance officers was heard of—before Sir Henry James and himself suggested that there ought to be an accurate survey of this region—Mr. Holland had already laid down the great outlines of the country, and in previous communications had made them known to the Society. There was no doubt that an exact survey was most desirable, as it might lead to a more accurate interpretation of the narrative of Holy Scripture. He might ask Mr. Holland what extent of this region would be trigonometrically surveyed on the scale which he had spoken of?

Mr. HOLLAND replied that the two mountains Jebel Serbal and Jebel Mûsa would be surveyed on the scale of six inches to the mile; the rest of the region on a scale of two inches to the mile. It was not necessary, in a Biblical point of view, to survey the lower part of the country. There could be no Mount Sinai south of Jebel Mûsa; but it might be possible to trace the route taken by the Israelites northward from the Mount.

Mr. HOLLAND, in reply to a question by Mr. Bracebridge concerning the use of the aneroid barometer, stated that above 4500 feet they did not find

the aneroid accurate at all. They had five of these instruments working together, and they all differed; though at a lower level they all agreed.

Mr. SAMUEL WOODS said he had read with great interest, a few years back, a book by the Rev. Charles Foster, called 'Sinai Photographed,' in which was laid down a system of interpretation, founded upon the discovery that the ancient Sinaitic letters agreed very nearly with those of the ancient Hebrew, but formed words in ancient Arabic. His interpretation was extremely interesting to the Biblical scholar, inasmuch as, simply aided by an Arabic Dictionary, it professed to give an accurate description of the circumstances of the Exodus engraven by the Israelites themselves upon the rocks at the time. It would be singular if a double system of interpretation were discovered, each giving a sense widely different from the other.

Mr. HOLLAND said that on this point his tongue was tied. He had promised Mr. Palmer that he would not explain what could very easily be explained, because Mr. Palmer was himself anxious to make known the work that he had in his note-book. But he might call attention to the copy exhibited to the meeting, of a large inscription decidedly Sinaitic and Greek. The inscriptions occurred on granite, limestone, and sandstone. They were not all equally clear. Some were more weathered than others; some were made on stone with a dark external covering, so that the lighter character of the stone shone through when chipped away. Some were engraven more deeply than others; some had been washed by floods. A great number were quite as plain as on the day they were made. They had copied 2500 perfectly legible inscriptions: 12 of them were bilingual,—Greek and Sinaitic,—cut by the same hand, as far as could be judged.

2. *Journey across the Great Salt Desert from Hanfila to the Foot of the Abyssinian Alps.* By WERNER MUNZINGER.

[ABSTRACT.]

IN June, 1867, M. Munzinger, H.M. Consular Agent at Massowa, was employed by the British Government to explore the route which leads from Hanfila, on the coast of the Red Sea, to the Abyssinian highlands. This route, passing over the great salt desert so graphically described by Fathers Mendez and Lobo in the seventeenth century, has never since been traversed by any European capable of recording his impressions.

M. Munzinger had eight men with him, all armed with muskets, and he took a small supply of necessary provisions and medicines. His instruments were two watches, an azimuth compass, and an aneroid by Pastorelli. On the 10th of June he landed on the arid coast of Hanfila Bay, where there was neither tree nor shrub. The village of Hanfila consists of about twenty huts, and is ruled by a chief who remembered the visit of Mr. Salt in 1810, and whose mother, Alia, was famous in youth for her beauty, and in maturer years for great wisdom and a generous hospitality. But the people of the coast have no influence inland, and M. Munzinger had to make friends with Fridello, the principal chief of the Dumhoitas,